

THAT WHICH IS CLAIMED IS:

1. A process comprising:

(1) mixing Stream 1 with Stream 2 to produce Stream 3;

wherein said mixing occurs in Mixing Zone One;

wherein Stream 1 comprises at least one catalyst deactivating agent;

wherein Stream 2 comprises a reaction mixture;

wherein said reaction mixture comprises at least one

polyolefin, at least one catalyst, at least one diluent, and at

least one monomer;

wherein Stream 3 comprises at least one polyolefin, at least one deactivated catalyst, at least one diluent, and at least one monomer;

(2) transporting at least a portion of Stream 3 from said Mixing Zone One through Stream Zone 1 and to Separating Zone One;

(3) separating Stream 3 in said Separating Zone One into Stream 4 and Stream 5;

wherein said Stream 4 comprises a polyolefin lean stream

wherein the majority of said Stream 4 comprises at least one diluent;

- 20 wherein said Stream 5 comprises a polyolefin rich stream wherein
the majority of said Stream 5 comprises at least one polyolefin;
- (4) transporting Stream 5 from said Separating Zone One through a
Stream Zone 3 to an Agglomerating Zone One;
- (5) agglomerating Stream 5 in said Agglomerating Zone One to
25 produce a Stream 6, wherein Stream 6 comprises at least one
agglomerated polyolefin;
- (6) transporting Stream 6 from said Agglomerating Zone One
through Stream Zone 4 to a Product Recovery Zone.
2. A process according to Claim 1 wherein said deactivating agent is
selected from the group consisting of water, alcohols, and other oxygen-
containing materials.
3. A process according to Claim 2 wherein said polyolefin is selected from
the group consisting of homopolymers consisting essentially of
polymerized monomers having from 2 to about 10 carbon atoms per
molecule and copolymers comprising at least two different polymerized
5 monomers having from 2 to about 16 carbon atoms per molecule.
4. A process according to Claim 3 wherein said catalyst is selected from
the group consisting of Ziegler-Natta catalysts, Phillips catalysts, and
metallocene catalysts;

wherein said catalysts comprise transition metals of Groups IVB-VIII of the Periodic Table of Elements.

5. A process according to Claim 4 wherein said diluent is isobutane.
6. A process according to Claim 5 wherein the amount of deactivating agent utilized ranges from about 10^{-6} moles of deactivating agent per mole of catalyst to about 10^2 moles of deactivating agent per mole of catalyst.
7. A process according to Claim 6 wherein said polyolefin is a homopolymer consisting essentially of polymerized ethylene.
8. A process according to Claim 7 wherein said deactivating agent utilized ranges from about 0.10 moles of deactivating agent per mole of catalyst to about 5 moles of deactivating agent per mole of catalyst.
9. A process according to Claim 8 wherein said deactivating agent is water.
10. A process according to Claim 1 wherein said Separating Zone One comprises:
 - (3.1) heating Stream 3 in Heating Zone One producing Stream 3A;
 - (3.2) transporting Stream 3A from said Heating Zone One through Stream Zone 1A to a High Pressure Separating Zone;
 - (3.3) separating Stream 3A in said High Pressure Separating Zone to produce Stream 4A and Stream 5A;

wherein said Stream 4A comprises a polyolefin lean stream
wherein the majority of said Stream 4A comprises at least one
diluent;

wherein said Stream 5A comprises a polyolefin rich stream
wherein the majority of said Stream 5A comprises at least one
polyolefin;

(3.9) transporting Stream 5A from said High Pressure Separating Zone
through Stream Zone 1B to a Purge Zone Two;

(3.10) purging Stream 5A in said Purge Zone Two with a gas to separate
Stream 5A into Stream 4C and Stream 5D;

wherein said Stream 4C comprises a polyolefin lean stream
wherein the majority of said Stream 4C comprises said gas and at
least one diluent;

wherein said Stream 5D comprises a polyolefin rich stream
wherein the majority of said Stream 5D comprise at least one
polyolefin;

(3.11) transporting Stream 5D from said Purge Zone Two through a
Stream Zone 3B to an Agglomerating Zone One.

11. A process according to Claim 1 wherein said Separating Zone One
comprises:

- (3.1) heating Stream 3 in Heating Zone One producing Stream 3A;
- (3.2) transporting Stream 3A from said Heating Zone One through
Stream Zone 1A to a High Pressure Separating Zone;
- (3.3) separating Stream 3A in said High Pressure Separating Zone to
produce Stream 4A and Stream 5A;
wherein said Stream 4A comprises a polyolefin lean stream
wherein the majority of said Stream 4A comprises at least one
diluent;
wherein said Stream 5A comprises a polyolefin rich stream
wherein the majority of said Stream 5A comprises at least one
polyolefin;
- (3.4) transporting Stream 5A from said High Pressure Separating Zone
through Stream Zone 1B to a Low Pressure Separating Zone;
- (3.5) further separating Stream 5A in said Low Pressure Separating
Zone to produce Stream 4B and Stream 5B;
wherein said Stream 4B comprises a polyolefin lean stream
wherein the majority of said Stream 4B comprises at least one
diluent;

wherein said Stream 5B comprises a polyolefin rich stream

wherein the majority of said Stream 5B comprises at least one polyolefin;

(3.6) transporting Stream 5B from said Low Pressure Separating Zone through Stream Zone 1C to a Purge Zone One;

(3.7) purging Stream 5B in said Purge Zone One with a gas to separate Stream 5B into Stream 4D and Stream 5C;

wherein said Stream 4D comprises a polyolefin lean stream

wherein the majority of said Stream 4D comprises said gas and at least one diluent;

wherein said Stream 5C comprises a polyolefin rich stream

wherein the majority of said Stream 5C comprises at least one polyolefin;

(3.8) transporting Stream 5B from said Purge Zone One through a Stream Zone 3A to an Agglomerating Zone One.

12. A process according to Claim 1 wherein said Separation Zone One further comprises an Alternate Separating Zone.
13. A process according to Claim 12 wherein said Alternate Separating Zone comprises the following process steps:

(3.12) transporting at least a portion of Stream 3 from said Mixing Zone

One through Stream Zone 5 to said Alternate Separating Zone;

5 (3.13) separating Stream 3 in said Alternate Separating Zone into

Stream 7, Stream 8, and Stream 9;

wherein Stream 7 comprises a polyolefin lean stream wherein a majority of said Stream 7 comprises at least one diluent;

wherein Stream 8 comprises a polyolefin rich stream wherein a majority of said Stream 8 comprises at least one polyolefin not suitable for agglomerating; and

wherein Stream 9 comprises a polyolefin rich stream wherein a majority of said Stream 9 comprises at least one polyolefin suitable for agglomerating;

10 (3.14) transporting Stream 9 from said Alternate Separating Zone

through Stream Zone 8 to said Agglomerating Zone One.

15 14. An apparatus that performs the process in Claim 1.